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Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ..... Office No. 2980

LOCALITY

State Alaska

General locality Shelikof

Locality Strait

1908

CHIEF OF PARTY

W. E. Dibrell

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Department of Commerce and Labor

COAST AND GEODETIC SURVEY

O. H. Tittmann,
Superintendent.

State: Alaska.

DESCRIPTIVE REPORT.

Hydrographic Sheet No. 2980

LOCALITY:

Shelikof Strait

1908.

CHIEF OF PARTY:

W. C. Dibrell

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DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SHEET NO. 2980 (FIELD NO. 1) SHELIKOF STRAIT, ALASKA.

SCALE 1 - 200 000

This sheet embraces the northern part of Shelikof Strait and includes the entire area in which surveys were made by this party during the season of 1908. The following report will therefore not be restricted to a description of the hydrography to be plotted on this projection, but for the sake of continuity and economy will include a general description and report of the whole area examined or surveyed by the party, excepting only Alimvoak Bay and vicinity. For that locality see Descriptive Report accompanying topographic sheets # 2872, # 2873, 2873a and hydrographic sheet Field # 2. In this report will be included; a general statement of the work done and methods employed; such information as has been collected by the party for the Coast Pilot; information of probable value to other survey parties visiting the locality; and such notes as may be of assistance to the cartographer in revising the chart. All reports should be consulted, for information will not in general be repeated. See other descriptive reports and descriptions of stations. Unless otherwise stated bearings are true and distances in yards and nautical miles.

2. A scheme of triangulation for the control of this area was developed by the party during the summer, this being the principal work of the season. The triangulation connects at the northern part of Shelikof Strait ~~Strait~~ with former triangulation on the Barren Islands and Point Banks, Shuyak Island, and with a scheme extended into Cook Inlet by Assistant Rhodes. In the vicinity of Kupreanof

Strait the triangulation connects with former work brought across Kodiak Island and with an extension of the scheme southward in Shelikof Strait by Assistant Hodgkins. The triangulation points coming within the area examined by this party have been computed and plotted on the projection. It is not probable that the office adjustment of the triangulation will appreciably affect the positions as signed to the stations on this sheet. While the triangulation was in progress many theodolite cuts were obtained to important topographic features. These cuts have been plotted on the sheet and the features drawn in so far as practicable. The theodolite cuts are supplemented by sextant cuts taken while sounding in the Strait.

3. No attempt was made to execute a detailed survey of Shelikof Strait, excepting in Alimvoak Bay and vicinity, as the attention of the party was occupied with the triangulation until near the end of the season; but, information of value was gathered by the methods indicated above and by observation. Especial endeavor was made to locate in geographical position points, important off-lying islets, and important dangers to navigation.

4. The hydrography to be plotted on this sheet was executed with the ship using the Tanner or the Sigsbee machines, without tubes, and stopping to sound. The principal lines are from three to four miles apart. As the depth is very regular it is not believed that closer lines are needed. On account of lack of time and absence of sufficient number of signals no attempt was made to complete the hydrography up to the shore or the outlying islands. Wherever conditions permitted however additional soundings were taken over areas inside the thirty fathom curve besides those of the regular transverse lines. It will be noted that a number of lines parallel the coast. Such lines do not in general furnish a good representation

of the slope of the bottom, but in the present case in order to obtain as many soundings as possible in the limited time available, the lines were run from and to the anchorages, and on one or two occasions in a heavy south-westerly sea, hydrography was possible only by crossing the swell. The alongshore lines in the absence of a complete development have considerable practical value to the navigator, giving him some idea of about how close to the land he may pass. Excepting near the shore and over a bank south-west of Cape Douglas, to be further noted below, the hydrography is considered complete within the area examined; namely, from about 59° north latitude south-westward to a line drawn across the Strait from Kukak Bay to a point about three or four miles north of Raspberry Point. This hydrography was executed under the direction of the Chief of Party, other officers relieving at times.

5. As it is desirable that a new chart be issued as early as practicable, and as more rapid work can be done in the office than on board ship the sheet is forwarded incomplete. The topographic features have been drawn in but the hydrographic positions and soundings have not been plotted.

6. That part of Shelikof Strait under consideration lies between the main land of Alaska on the north-west and Barren, Shuyak and Kodiak Islands on the south-east. It has an average breadth here of about 25 miles, and a length of about 50 miles is considered in this report. On the north-western side the land is mountainous and rises by steep slopes from the shore. On the south-eastern side, the Barren Islands and Kodiak Island are mountainous but Shuyak Island is comparatively low. In summer the snow passes off the mountains of the islands but on the mainland the summits are white throughout the year. For brief descriptions of mountain peaks de-

termined, see Descriptions of Triangulation Stations. Heights are furnished by the triangulation but are not yet computed. The summits of the mountains are obscured much of the time by clouds.

7. Ushagat, the highest of the Barren Islands, shows prominently in fair weather from the northern part of Shelikof Strait. It can be seen as far south as Alimvoak Bay. Iliamna Mountain can be seen in fair weather from the vicinity of Cape Paramanof a distance of more than one hundred miles. Augustine Mountain a symmetrical volcanic cone can be seen from the Strait when clear of Cape Douglas. This volcano is said to be not entirely extinct, but no signs of activity were noticed by this party during the past season.

8. Mount Douglas and Four Peak Mountain (Peaks "D" & "H") are prominent elevations located 9 miles west and 14 miles west-southwest, respectively, from Cape Douglas. Both have broad shapeless summits. They are not readily distinguished from each other, but if one can be seen, generally the other can also. From the summit of Mount Douglas the land decreases in elevation to the north-eastward in the form of two sharp rocky ridges with many pointed summits, one ridge terminating at Peak "A" and the other at Peak "B". A small glacier lies between these two ridges.

9. Between Mount Douglas and Four Peak Mountain is a depression in which a larger glacier has its origin. This glacier descends the slope and terminates near the shore at a point about west of Sea Otter Island. A large terminal moraine about 300 feet high has been formed across its face and the discharge is now to northward and southward of the moraine. The glacier and the moraine are quite noticeable from seaward after the snow melts. Between the large glacier and Cape Douglas, two smaller but noticeable glaciers descend the eastern slope of Mount Douglas nearly to sea level. They are

separated by a ragged rocky spur of the mountain. But few directions were taken to these glaciers, as early in the season before the disappearance of the snow near the coast they were not noticeable and their importance as geographical features was not appreciated.

10. Southward of Four Peaked Mountain the land as seen from the Strait is high but decreased in elevation until Hallo Bay is reached, back of which is a noticeable low valley. From this valley the land rises abruptly again to the southward, culminating apparently in two sharp snow clad peaks "P" and "Q", twelve miles west-north-west and fourteen miles west by north, respectively, from Cape Nukshak. Other high peaks show to south-westward of Peak "Q", but no information can be furnished by this party concerning them.

11. Shaw Island lies 10 miles north-north-west from Cape Douglas. It's position was determined by a number of sextant angles. The island is low, flat, nearly level, grass-covered, and has a rocky shore line. It's highest part is estimated to be 50 feet above sea-level. It is only 2/3 mile long instead of 4 miles as shown upon the chart. It lies about north-east and south-west and has a breadth of about one half its length. Between the island and the mainland is a channel 1 3/4 miles wide. The point opposite the island is bold and some low rocks lie just off the point. The sunken rocks shown in this channel on the chart appear not to exist. In heavy north-east weather the appearance of the sea in this channel would lead one to expect shoal water, but the "Explorer" was taken through here twice about in mid channel, or perhaps nearer the island, sounding carefully with hand lead and nothing less than 13 fathoms (about mean tide) sand bottom was found, From the northern end of the island a long ledge of rocks partly bare at low water,

and breaking in a swell, extends in a northerly or north-westerly direction about 3/4 mile. Another similar ledge of rock extends out parallel to the first from a point near the southern end of the island. This ledge is much shorter than the other.

12. Anchorage may be had close up to southern end of island, with right tangent bearing east magnetic in 10 to 15 fathoms sticky bottom. The "Explorer" rode out one northerly blow here but there is little protection on account of the small size of the island. There is no protection from east or south-east winds. On one occasion this anchorage was approached by rounding the northern end of the island at a distance of about 2 miles. The sub-marine sentry set at 15 fathoms did not trip until well around to westward of the island.

13. From the point abreast of Shaw Island, the shore line trends about west magnetic into Kamishak Bay. The land is low along the beach, with high ledges a short distance inland. Just westward of the mountain range of which "Peak A" is the northern end, there is a glacier of some size, terminating in a large moraine of discolored debris near the shore.

14. Between "Peak A" and "Peak B", the shore line recedes into a circular bay affording anchorage in 13 to 15 fathoms sandy bottom. The anchorage is sheltered from south, south-west and west winds, but in westerly gales the "willy waws" come over the mountains with great force. No dangers were noted excepting close to shore. Back from the bay is a short valley in which there is a glacier. At the head of the bight there is a shingle beach, otherwise the shore line is abrupt and rocky.

15. The point on the south-eastern side of this bight, about midway between Shaw Island and Cape Douglas is a bold rock bluff

about one hundred feet high. The foot of the bluff is awash at high water but at low water a rocky ledge bares to a width of about 50 yards. The point is double, the two heads being about 1/4mile apart and the shore line receding slightly between the two. Just clear of the bluff off the northern head there is a sharp pinnacle of rock (Pin ⊙) having about the same height as the bluff.(Possibly triangulation furnishes height of pinnacle). A ledge of rock partly bare at low water extends seaward from each of the two points, and at low water the sea breaks on these ledges to a distance of perhaps 100 yards from the bluff. At a distance of 900 or 1000 yards from high water line about 15 fathoms of water is found.

16. The next bight to the southward seems to be too shoal for anchorage close in. A vessel may anchor however well off shore. There are a number of rocks near the head of the bight that show at low water. The shore line is rocky bluff excepting at the head, where it is sloping.

17. Dry Bay (Sukoi Bay (B.G.N.)) was not examined but it is reported foul (by Captain Rhodes). A rock uncovers near the middle of the entrance and a ledge showing at low water lies between the rock and the south shore. It is open to the north-eastward and it is from that direction that shelter is most needed in this locality. It extends a long distance inland at high water and at that stage of the tide affords shelter for small boats in any weather. The inner part was not visited however at low water and it is not known how much of it goes dry.

18. Cape Douglas is a low grassy tongue of land projecting about three miles (? eastward) westward from the main land and connected with it only by a narrow and very low neck. From seaward the cape appears to be nearly level, sloping down to the sea at the outer point. Its

surface is in reality very irregular and there are several ridges lying east and west. The highest point seems to be at South Douglas triangulation station, where it is 189 feet above mean sealevel; but there is little difference between the elevation here and at the inner part of the peninsula where the descent is abrupt to the low neck. The shore line is rocky and very irregular. There are several bights with rocky points between. A number of tangent cuts were taken to the cape and it has been sketched in, correct as to position but with more or less inaccuracy in shape. Rocks bare at low water to a distance of about 1/2 mile off the point. The cape may safely be rounded however at a distance of 1 1/4 miles from high water line. A rock uncovers on south side of peninsula but it is close to shore.

19. The bight on south side of Cape Douglas neck affords anchorage sheltered from west, north-west and north winds. There is some shelter in north-east winds, but if the weather is very heavy more or less swell rolls around the point. A stream of some size flows along the neck and discharges into the north-eastern part of the bay at the foot of a precipitous bluff. The silt brought down by this river has filled up this part of the bay and a sand bar dries at low water nearly out to the south-western point of Cape Douglas. Boats may enter the river mouth excepting at dead low water. Anchorage in 6 fathoms sand bottom with two points on right tangent of Cape Douglas in range bearing east magnetic, about midway between opposite shores. A sand beach encircles the bight, ending at a low rocky ledge bearing west-south-west from southwestern point of Cape Douglas peninsula. This ledge projects a little from the general shore line and possibly is an island at high water. The ledge bares at low water to a distance of perhaps 50 yards from

high water line.

20. From here the main shore trends about south-southwest in easy curves for 8 miles to triangulation station "Dark" where it abruptly recedes into a small bay. The beach is shingle, with boulders off the large glacial moraine previously mentioned. It is flat and a broad strip bares at low water. Boats may land anywhere where it is quiet but there is no protection from a swell. One and one half miles northward of "Dark" the shingle beach gives place to a steep rocky shore line which extends around into the bight.

21. (Sea Otter Island) Now Douglas Reef lying 5 1/2 miles south of Cape Douglas is small in extent and low. From the center of the islet a tangent to Cape Douglas bears N. 7°E. It appears to be about 50 yards long north-east and south-west and about 20 yards wide. It apparently is 8 or 10 feet above high water, and drift wood indicates that in heavy north-east weather the sea washes over it at high water. The islet is favorably located for cutting in signals along the shore. It was not visited by this party. It is the highest part of a rocky reef showing some extent at low water. The reef trends about north-east and south-west and appears to be narrow in comparison with its length. (The sketch on the sheet is probably exaggerated on the inshore side). Tangent cuts indicate a length of nearly two miles. The least cast obtained on a careful line of soundings, run on a north-east course (true) and passing the islet at a distance of 1800 yards, was 19 fathoms. But, just one mile east of the center of the islet the depth shoals abruptly from 45 and 50 fathoms to 9 fathoms, rocky bottom. Vessels may therefore pass the islet safely on a north-east course (true) at a distance of one mile from its center, but the course should not be altered to the northward until well clear of the reef.

22. If bound in to the anchorage on south side of Cape Douglas, bring left tangent to south-west point of Cape Douglas peninsula in range with prominent dark rocky mountain on top of ridge, bearing about N. 60° W. magnetic and follow this range until nearly up to the front range. Give the point a berth of about 1/2 mile and round into anchorage. The range passes about 2/3 mile from visible end of Sea Otter Reef but carries good water with gradually shoaling depth. If in doubt or back range is obscured by clouds, keep over toward Cape Douglas, as there is good water close up to the land. Summit of the mountain used for back range is studded with sharp pinnacles and its outline somewhat resembles the periphery of a circular saw. The front range shows but little above the water from off the reef.

23. Two and three quarter miles S. 65 1/2° W. from Sea Otter Islet, one and one half miles off shore are two rocks a few yards apart which are awash at high water. The higher one is "Two ⊙ ". Just south of "Two" is a rocky reef marked by kelp and showing bare rocks at low water. The position and extent of this reef were not accurately determined, but it appears to extend about 3/4 mile south of "Two" and to be circular in shape with deep water between the rocks and the reef. The nearest line of soundings passes about 1 1/2 miles south-east of the reef. Good water (not less than 19 fathoms) was found on this line.

24. There is a navigable channel to westward of Sea Otter and the other reef, but it was not decided whether vessels may safely pass from the southern end of this channel southward of the lower reef into the Strait. The "Explorer" was taken through this way on one accasion, passing near the shore and giving the southern reef a berth of perhaps 1 1/2 or 2 miles. The least water found was 7 fathoms rocky bottom, near the shore and it was not considered

entirely safe navigating in the absence of more knowledge concerning the locality. There is 14 or 15 fathoms midway between "Two" and the shore and the water deepens somewhat to the north-eastward. Near mid channel there seem to be no dangers from Cape Douglas to abreast of the southern reef.

25. South of Dark △, 1 1/4 miles off shore is a dangerous rock, apparently a pinnacle, awash at about half tide. It is unmarked by kelp, seldom breaks when covered, and at high water there usually is no sign of its existence. From the rock Dark △ (highest part of mountain) bears N. 12° W.

26. About 1 1/2 miles south-westerly from the rock awash mentioned in last paragraph and about 1 1/2 miles off shore are two patches of kelp. The kelp cannot be seen well excepting at low water, and the sea seldom breaks here. The positions of these kelp patches on the sheet are only approximate. From the eastern patch Dark △ bears N. 13° E., this direction being fixed by a theodolite cut from the triangulation station.

27. If desiring to land a party near Dark △, bring the station to bear N. 1° E. (N. 23° W. mag.) and steer for it , picking up a range to guard against set, and anchor in about 9 fathoms water sand bottom about 2/3 mile off shore, with a low grassy mound on next point to southward in range with "Peak J", a connical mountain about 4 miles distant. This course passes about midway between the kelp patches and the rock awash. There is no shelter at this anchorage, and boats cannot land with much swell from the north-east.

28. Back of the bight near Dark △ is a low area of some extent in which there are a number of ponds. A small but noticeable glacier flows down a ravine and feeds a small stream, which discharges near the foot of the mountain. Boats cannot enter the mouth of the creek,

excepting perhaps at the top of the tide. The beach around the bight is pebble. Some rocks show in the bight near the shore.

29. From Dark △ the shore trends south-west with little variation 6 miles to abreast of Kiukpalik Island where there is a projecting bluff point. A leaning pinnacle of rock (Lean ⊙) nearly as high as the bluff stands on the point, just clear of the bluff. Another tall rock stands 400 or 500 yards north-west of "Lean ⊙ ", apparently on shore line.

30. South-west of "Lean ⊙" the shore trends more to the westward, but practically nothing was learned by the party concerning the coast from here to Nukshak, as much of it appears foul and the off-lying islands furnished good locations for triangulation points. Swikshak Bay is reported shoal. Cape Chiniak is approximately located on the sheet by a cut from Nukshak △ and a magnetic bearing from Shak △. There is a high hill near the end of the cape that apparently would make a good triangulation point.

31. Kiukpalik Island is midway between Cape Douglas and Cape Nukshak 17 1/2 miles from each. It is about 3/4 mile wide and about 1 1/4 miles long. The shore line is concave toward the land and convex toward the Strait. It is 155 feet high and as seen from the Strait is nearly level. The highest ridge is near the north-western side from which it slopes to the south-~~we~~ea-stward. It is grass covered with rocky shore line.

32. There is a good navigable channel between the island and the main land and anchorage may be had in 8 or 9 fathoms mud bottom in the bight on western side near southern end of island. ~~The~~ The shore here seems clear of dangers and may be approached very close. A vessel passing to westward of Kiukpalik Island should keep near the island as no examination has been made near the main shore and

there is indication of shoal water. Care should be taken however to avoid the shoal mentioned in next paragraph. The anchorage is sheltered in easterly winds but affords little protection in any other weather.

33. A shoal marked by kelp lies off northern end of island about 1/2 mile from shore. From the shoal, northwestern point of island bears south-east magnetic. Position on sheet is approximate only. The channel lies to westward of the kelp patch. As little as five fathoms was found in passing the shoal. Brakers were never seen here and the kelp is scant of growth and not easily seen.

34. A rocky ledge uncovers at low water off south-west point of island, but it is close up to the shore and not a danger to navigation. Vessels may pass in safety 1/2 or 3/4 mile off the southern end of the island about 15 fathoms being found at this distance.

35. On south-eastern side rocks show at low water to a distance estimated at 150 yards. A safe distance to pass the island on this side in the absence of a complete survey is 1 1/2 miles. Thirty four fathoms was found a little more than 1/2 mile east of island, the depth shoaling to north-eastward to 18 fathoms. The area immediately north-east of the island was not examined. It is probable that the sunken rock shown here on the chart is the one mentioned above off the north-western part of the island. It was customary when passing from west side of Kiukpalik up the coast with the "Explorer" to haul well to eastward when clear of the shoal.

36. Shakun Islands. Five miles west-south-west from Kiukpalik Island about 2 1/2 miles off shore is a chain of small islands not not shown on the chart. These will be referred to in this report as the "Shakun Islands". Shak 4 is on the north-eastern and largest of

the group. This one is 500 or 600 yards long and about 100 yards wide. (See a fair sketch in Description of △ Stations). From this island several smaller ones trend in a south-south-west direction about 1 1/2 miles. The islands are all rocky but the larger ones have a covering of grass. The largest one has considerable sand on it and has a sand beach on western side. From the southern end of this chain a semi-circular rocky reef extends to Shakun Rock. The sea breaks on this reef when there is a swell, and bare heads show at low water.

37. Shakun Rock is a prominent dark pinnacle rock standing 5 miles S. 50° W. from Kiukpalik Island and 1 1/2 miles south-east from the largest of the Shakun Islands. It is small in area at the top but rests on a larger base and is estimated to be 75 feet high.(Triangulation should furnish height). The water between the rock and Shakun Islands is shoal and kelp was noted some distance north or north-westerly from the rock. Dark △ (highest part of mountain) in range with left tangent to Kiukpalik Island bearing N. 27° E. leads in good water up to the island, and this range is a safe and convenient guide for passing Shakun Rock until complete knowledge of the locality is available.

38. From the Shakun Islands shoal water appears to extend north and north-west to the shore. Attempt was made to find anchorage behind the Shakun Islands that would be sheltered in north-east weather, but with a right tangent to the southern islet bearing east magnetic the water shoaled suddenly to less than four fathoms and at low water the south-east swell broke heavily in one continuous break, reaching apparently to the shore. It was found impossible therefore to get any shelter here from the north-east. The chart of this locality is erronous and quite misleading.

39. Good water lies between Shakun Rock and Cape Nukshak, and

if passing along the coast, a course may be set direct for Cape Nukshak or Cape Kuliak from a point on above range abreast of the rock.

40. Cape Nukshak is an island. It is narrow but has a lenghh east and west of 1/2 mile.(A good sketch will be found in Description of triangulation Station). It is grass covered with rocky shore line and is 134 feet high. It is precipitous on northern side and has near the middle of its length a depression connecting two small bights. South side appearrs to be clear of dangers excepting close to shore, 15 fathoms being found about 1/2 mile from the island. On north side water is very deep and vessels cannot anchor. Rocks show at low water off the eastern end to a distance af about 100 or 150 yards from high water line, but vessels may safely pass at a distance of 3/4 mile. Close to western end of island is a conical rock nearly as high as the island. The channel between Nukshak Island ahd the land to the westward is 380 yards wide. It has some sunken rocks but there is a narrow channel of deep water suitable only for boats. The land west of the island is grass covered and is flat like the island as far as the foot of the steep slopes of peak "0". There is a break however through which the sea washes at high water forming a second ~~channel.~~ island

41. Hallo Bay was not examined excepting near the cape. It is believed however that there is more water than shown on the chart. Good anchorage sheltered from southerly and westerly weather was found a short distance inside of Cape Nukshak with the foot of the eastern slope of Peak "0" bearing south magnetic, in 22 fathoms mud bottom about 400 yards off shore. The reef shown on sheet on north side of Hallo Bay is only approximate in position. Cuts to it were obtained only from Nukshak $\triangle$. It is covered at high water and is not marked by

kelp. It does not show continuous throughout its length at low water. It appears doubtful if Hallo Bay affords good shelter in north-east weather.

42. Ninagiak Island is fairly well determined. It is estimated to be 200 feet high and its highest point is a well defined knob. The island is noticeable from some distance.

43. About 1 1/2 miles south-west of Cape Nukshak shoal water, indicated by kelp and rocky heads showing at low water, extends nearly a mile off shore. A course laid from a safe distance off Cape Nukshak for Cape Gull or Cape Kuliak will clear this shoal.

44. From Cape Nukshak the shore line trends south-westerly into Kukak Bay. It is a very irregular rocky bluff, and detached rocks show to a considerable distance off shore, about as shown upon chart 8502.

45. Kukak Bay was not surveyed by this party but it was much used by the "Explorer" as a refuge from north-east gales. As the ship was there only in stormy or rainy weather no opportunity was found to do any survey work for the improvement of the chart. Before leaving the working grounds, however, I made a reconnaisance of the bay in the launch, sketching roughly its shape and plotting by estimation soundings which were made from time to time. I did not know until after leaving the locality that a plan of this bay was published by the Coast Survey, as it is not included with the other harbor plans of this region, but with those farther to the westward, and our index maps (unfortunately) do not show all charts of harbors. It of course would have been found in the alphabetical index had it occurred to me to look for a plan of Kukak Bay.

46. The sketch above mentioned was found to agree very well with the chart published from the Russian survey, and it is there-

fore not forwarded. The chart gives a fair general idea of the bay, but the topography is not accurate, and but few soundings are shown. The bay has a great depth and the shores are in general steep. The area available for anchorage is therefore limited.

47. The anchorage used by the "Explorer" is on west side of Aguligik Island with a rock awash bearing north-east magnetic and a small bluff on right tangent of the little (high water) islet off south-west point of island in range with a similar bluff on right tangent of island, bearing south-east (magnetic). The islet is not correctly shown on the chart relative to the large island, and the rock awash is shown as a bare rock. It covers completely at the top of the tide. The bottom here is very irregular, anywhere from 8 to 17 fathoms being found within an area a few yards across. The lead indicates mud bottom, but it is hard to conceive of a mud bottom so irregular. It probably is rock with mud pockets. It is not good holding ground. The anchorage area here is very limited. There is room for only one vessel, and the anchor must be dropped accurately on position, as the water deepens abruptly farther off shore, and there is scant swinging room inshore. The water shoals gradually toward the land, several rock heads showing at dead low water near the rock awash. The anchorage is sheltered except from south-west winds. It is well sheltered from the sea in north-east weather, but the anchor will not hold in the strongest gales. It has but a few yards to drag before the chain is up and down with forty five fathoms or more out. Fortunately there is plenty of room to leeward and there is no danger to a steamer if the engines are ready. In south-west weather there is not room for a vessel to stretch her chain toward the land.

48. The bight south of Aguligik Island looks promising for an-

chorage, but it is too deep, A depth under 20 fathoms is too near the shore for swinging room.

49. The bight south of Aguchik Island appears to afford good anchorage sheltered from all directions. Thirty fathoms was found about south-east from the point of the island and from here it shoals gradually in a north-east direction toward the head of the bight. The bottom is mud, sticky in places. Deep water (25 fathoms) was found quite close up to the island. No dangers were noted,but it was near high water at the time of making the reccohnaissance.

50. At the head of Kukak Bay (that is S.W. end) the water was found to shoal abruptly from twenty fathoms to two and even less some distance from the shore (estimated at 1/2 mile) indicating an extensive mud flat bare at low water.

51. The surrounding country is mountainous. There is an extensive valley at the head of the bay and another valley leads off north-westerly from about the middle of its length. A river flows down the latter and discharges into the bay. Two fathoms was found at high water about 1/8 mile off the river mouth, the shoaling being abrupt. The chart seems to indicate that the surrounding country is wooded. Such is not the case. There are some deciduous trees in the valleys mentioned above, otherwise the land is bare of timber, excepting perhaps some small growth.

52. The bight west of Kukak village was not investigated but it looks forbidding on account of the rocks in the entrance. The anchorage shown off the village is not sheltered in north-east or east winds and therefore would not be used unless it was desired to communicate with the shore at that place. Nothing was seen of the village and no natives were seen in the vicinity.

53. Kukak Bay is easily made. The only precaution necessary

is to keep near mid-channel. It is recommended that a survey be made of the bay, or at least of the head of the bay, as soon as convenient. The name of this bay is pronounced by persons familiar with local geographical names as though it were spelled Kugak. A curious natural feature of this locality is the unusual number of columnar rocks seen along the shore of the bay. Some of these resemble totem poles and appear at first sight to be artificial.

54. Cape Ugyak was not accurately determined, but tangent cuts were taken from Nukshak and Gull triangulation stations, thus fixing its bearing from each of the adjacent capes. It lacks 1200 yards of reaching out to a line drawn tangent to Capes Nukshak and Gull. Some detached rocks show at all times off the cape, but they do not extend to any great distance. A straight course clearing the two adjacent Capes will safely clear Cape Ugyak. A rock was observed to break at low water about in the position of the sunken rock shown on chart 8851, 1 3/4 miles N.W.1/2° W. (mag.) from Cape Ugyak.

55. Kaflia Bay affords excellent shelter for small crafts, but obstructions at the mouth appear to prohibit the entrance of vessels of any size. Just before closing work in Shelikof Strait I visited the locality for the purpose of making a reconnaissance, hoping to take the ship inside for shelter and to make a complete examination if not a survey. I anchored the ship in 26 fathoms about 3/4 mile off the mouth of the bay, and lowering the launch proceeded in it to make an examination of the channel leading inside. The entrance is narrow between shores and there is a small rocky islet lying a little north of mid-channel. Between this islet and the north side the water is shoal. About in mid-channel between the islet and the bold bluff on the south side is a sunken rock. When passing in, this rock was not seen and about 5 fathoms depth was

found in the entrance, it then being about high water. When coming out the tide had fallen slightly and the rock could be seen plainly, the sea breaking on it. There appeared at the time to be a deeper but narrow channel on either side of the rock.

56. The water inside is deep. There are two basins connected by a very narrow channel in which the least depth found was 6 fathoms (near H.W.). Both basins are small, hardly affording swing room for a steamer on account of the depth. From 20 to 35 fathoms was found near the middle of each. There is a coal claim near the bay and a prospector's cabin was seen on the south side of the outer basin. It was my desire to visit the camp for the purpose of gathering information, but rain and threatening weather compelled the party to abandon the work and return to the ship with all possible haste. The wind was freshening from the east making the berth of the ship a dangerous one and raising a very choppy sea on the ebb tide in the channel.

57. It is believed that Kaflia Bay is what is locally known as Fishkugak, or little Kugak Bay (as distinguished from Big Kugak,—Kukak Bay) but persons familiar with the local geography and the native names are not apt in accurately describing places or of pointing them out on the map. There is a report that the entrance dries at low water. The bay seems to be poorly represented on chart 8851, but it is considered unimportant and another sketch is therefore not forwarded.

58. Cape Gull is a bold headland, the seaward face being a rock bluff about 500 feet high. The Cape is broad with gradually rounding shore line receding toward Kaflia Bay on the north and turning abruptly into a small bay on the south. Some shoal water was noted on north-east side close to shore but off the bluff no

dangers were seen.

59. The bay south side of Cape Gull is sketched in on the sheet. It appears to be about one mile deep and somewhat less in width. Along the sides the shore line is rocky, steep on the north side and sloping on south, and there is a beach at the head. There are some lakes back from the head of the bay. Anchorage may be had in the bay in 9 fathoms sandy bottom with Cape Kuliak in range with point on south side of bay, approximately midway between shores. Enter between Cape Gull and islat off point on south side. Anchorage is sheltered from south-west, west and north-west winds.

60. A rocky islet estimated to be 15 feet above high water lies just off the point on south side of bay about south from Cape Gull and a little less than 1 1/2 miles distant from the signal on the bluff. There is a rock that bares at low water a few yards on outside of islet and there is shoal water between the islet and the adjacent point of the shore. The islet is fairly well determined by cuts from Nukshak Δ and Gull Δ. The records of Assistant Hodgkins probably show cuts from Kuliak.

61. Cape Kuliak shows from along the coast as a long tongue of land rising gradually from a steep and crumbling bluff to high mountains inland. The surface near the end of the cape is very broken and seems to be formed of glacial debris. There is a legend that the cape formerly was longer but that some years ago the outer part fell into the sea. A rock awash at about half tide lies just off the cape. No other dangers were noted, and anchorage was had in about 16 fathoms quite close to shore southward of rock. A line drawn tangent to Capes Nukshak and Kuliak passes a little outside of Cape Gull. This fact is mentioned for the reason that the chart shows Cape Gull projecting beyond this line.

62. Shuyak Island is low compared with the other land of this region and it shows no sharp peaks. It has some noticeable hills however and there are some high ridges that probably have an elevation of over a thousand feet. The highest land seems to be on the southern part. As seen from a distance its profile is fairly regular. There are two noticeable hills (Banks △ and "Peak a") near the north-eastern end, and another prominent hill 7 miles south-west of there. The three hills are shown on the sheet.

63. The island is very irregular in shape and is very much cut into by arms of the sea. It is not known if any of these afford anchorage. Parts of the island are bare but a large area of it supports a thick growth of spruce. Much of the timber near the coast is scrubby but some attains fair size.

64. No topographic work was done on Shuyak Island and on account of the irregularity of its shore line any sketch would be very inaccurate, but in the following paragraphs will be described some of the features determined for the improvement of the chart.

65. A small rock about fifteen or twenty feet high was determined off the north side of Perevalnie Island. This rock seemed to be the most north-eastern part of Shuyak Island. Perevalnie does not in general appear as separated from the main island.

66. Anchorage may be had in 23 fathoms sand bottom on north-western side of the peninsula terminating in Point Banks, about 1/2 mile off shore. There is less water nearer the shore with swinging room, but the bottom is rock. From the anchorage the northern one of the two prominent hills on Shuyak Island (Banks △) bears about south-east magnetic. There is a shoal a short distance beyond (south west) from the anchorage. There is no shelter here in a north-easter and it is a bad place to get out of in a heavy blow from that direc-

tion on account of the heavy sea that rolls around the north end of the Island and the heavy rips encountered off the island on the ebb tide.

67. The chain of islets extending north-eastward from the north-western part of Shuyak Island and called "Sea Otter Islands" on the chart are fairly well shown on the latest edition of # 8502. These islets were cut in and their proper representation is of considerable importance on account of their position relative to the land and to the adjacent navigable waters. It was found in plotting the cuts that the outer islet was not completely determined, but the position assigned to it on the sheet is correct within the limits necessary for charting purposes.

68. The large island lying 1 1/2 miles north-east of Shuyak is known as Larsen Island. It is nearly a mile long and about 1/2 mile wide. It is grass covered with rocky shore line and has an elevation of about 125 or 150 feet. It formerly was the site of a fox ranch and a shanty is still standing near the eastern side. A reef shows at low water about in the position marked "P.a" between the island and Shuyak. There probably is a channel between this reef and Larsen Island but no examination was made. A ledge on which the sea breaks occasionally extends a short distance off the eastern side of the island. Off the south-west end of the island there are several large black rocks. In north-east weather anchorage may be had with slight protection in the lee of the island just off these rocks in about 16 fathoms sand bottom. The ship was anchored on one occasion in north-westerly weather on the south-east side of the island, but there was little protection from the swell.

69. The passage between Larsen Island and the next islet to the northward was safely navigated by the "Explorer" on one occasion, but the water was found to shoal abruptly to 8 fathoms rocky bottom

in the edge of strong tide rips at a point about north of Larsen Island. The course was altered so as to pass nearer to the larger island and nothing less than 13 fathoms was found. The passage is not considered safe until it is surveyed.

70. Three small rocky islets lie north-eastward of Larsen Island the outer one being about 3 1/4 miles distant. About 600 yards off the outer one is a rock awash. It seems to bare only at low water but it usually is marked by breakers. It is about in range with the two outer islets and is well determined. This rock is the end of the chain and deep water is found to the northward. It has been passed at a distance of a mile or less to the northward with sentry set at 20 fathoms.

71. About south-west of the outer islet and about north of the next, a patch of rocks show at low water. This bunch of rocks has been plotted on the sheet with a fair degree of accuracy by noting its bearing from the islets when passing. Viewed from the direction of Point Banks at low stage of the tide the two outer islets seem to be continuous.

72. On one occasion while passing along the western side of theme islands with the sub-marine sentry set at 15 or 20 fathoms the kite tripped and a cast of the hand lead taken as quickly as possible with engines stopped showed 7 fathoms rocky bottom. The next cast gave 13 fathoms and the next no bottom. At the seven fathom sounding the northern end of the land off Cape Banks was in range with the middle of the three outer islets and this islet was estimated to be 2 miles distance. There probably is less water on the shoal.

73. The western side of Shuyak Island is irregular and fringed by a chain of rocks and islets lying fromone to two miles off shore.

Between the islets and the main land the water is shoal and there are many islets, rocks and kelp patches. There is a good passage for boats but at low water many of the shoals go dry. A long lagoon parallels the shore at a short distance inland. The land along this part of the coast is broken, generally timbered, and all under two hundred feet elevation excepting at Shuyak △, where there is a bald ridge about a mile in length approximating this height. The station is on the northern end of the ridge.

74. The highest of the off-lying islets mentioned above is about 150 feet high. It has rocky sides and a rounded grass covered summit. It is prominent and is a good land mark, especially since it occupies an important position off the coast of Shuyak Island. The island was determined in position by sextant angles taken from hydrographic positions to its highest part, and it is shown on the sheet. It lies 2 2/3 miles S.66 1/2° W. from Shuyak △.

75. One mile and a half north-east of the above island is a long narrow black rocky islet about 50 feet high. It was determined by sextant angles. It lies parallel to the shore and there are some detached rocks close to it.

76. Three quarters of a mile north-east of this islet is a small black rock. This rock determined by the intersection of two sextant cuts appears in the sounding record as a rock awash. It always shows several feet above the water however, and is therefore shown on the sheet by a dot. From the rock the signal at Shuyak △ bears S. 51° E. distant a little less than 1 1/4 miles. No dangers are noted between this rock and Larsen Island, 15 fathoms regular bottom being found about midway.

77. Vessels may safely pass the chain of islets just described at a distance of one mile. The least depth found on a line of sound-

ings passing 3/4 miles or a little less off the two larger islets was 22 fathoms abreast the northern one.

78. Anchorage may be had in moderate north-east or easterly weather south of the southern islet in about 20 fathoms sandy bottom close to shore. The surrounding topography is so irregular that it is unwise to attempt a description of the anchorage, and a stranger should use his own judgment, approaching at a low stage of the tide. Some rocks covered or awash at high water lie off the south side of the high island, and kelp shows between the island and the shore.

79. Just southward of the anchorage above mentioned there is an indentation perhaps a mile deep. Rocks and kelp show, especially about the entrance, and the bay does not look favorable for an anchorage. It would not be sheltered from westerly weather. About 50 or 100 yards inland from the gravel beach at the head of the bight tide water is found again. This is a long and devious arm with very strong currant in narrow parts, apparently connecting with the sea somewhere at the southern part of the island. There is considerable spruce timber here, some of it attaining fair size. Offsouth-west point of Shuyak Island rocks show at low water to some distance off shore. Shuyak Strait was not investigated. It apparently is not used by vessels. The current is reported to be very strong.

80. Afognak Island . The greater part of this island adjacent to Shelikof Strait is mountainous, many of the summits being sharp peaks. There is considerable spruce timber in places, but much of the country is devoid of trees and covered in summer with tall grass and thick alder bushes. At the northern part of the island there ia a comparatively flat area heavily wooded.

81. From Shuyak Strait to Black Cape the shore line is very

irregular and recedes some distance from the track of vessels passing ~~passing~~ along the west coast of Shuyak and Afognak Islands. The shore appears to be rocky and is bordered by land of moderate slope heavily wooded. Many islets lie off shore especially near Black Cape.

82. Three noticeable islets lie north-eastward of Black Cape about on range between the end of the cape and the islets off the western side of Shuyak. These islets were determined by sextant cuts and are shown upon the sheet. The two nearest Black Cape are perhaps 40 feet high, are flat-topped with rocky sides. The southern one of these two is in two or three parts and a large number of rocks and islets show between it and the shore. The northern one of the three is a large black rock. A safe navigable depth was found on sounding lines run 1/3 mile off the northern rock and 3/4 mile off the southern islet. The survey here is not complete however and a berth of not less than a mile is recommended. The 100 fathom curve passes 2 miles off the islets and Black Cape. From a point one mile off the"150 ft." islet west side Shuyak Island a straight course carrying good water may be laid for a point 1 mile off the islets just described.

83. Black Cape is a narrow tongue of land, sharp at its point, rising gradually from the end to the triangulation station. See description of stations and descriptive report accompanying topographic sheet No.3. Its extremity is a little short of a straight line joining the outermost islet lying to north-eastward (the rock 6 miles distant) with Cape Paramanof or Steep Cape. No dangers were noted off the cape and 19 fathoms was found about 1/2 mile from the point.

84. On south side of Black Cape there is a patch of rocks extending some distance off shore. These do not project into Shelikof Strait. Some of them are covered at high water but most of them show at all times. The bay on north side of Ban Island is full of rocks, but they do not extend beyond the outer end of the island. Between these rocks and those mentioned on south side of Black Cape there is an opening with deep water leading to an anchorage at the head of a bight. The anchorage is well sheltered in northerly and easterly weather and is directly exposed only to south-west. A strong southerly wind probably would send in a heavy swell.

85. To reach the anchorage stand in toward the bay north of Ban Island on an easterly (magnetic) course, passing the rocks on the port hand at a moderate distance, and when nearly up to the rocks showing ahead, the break in the rocks will be seen on the port bow. Pass in mid-channel through this opening on a north-easterly (magnetic) course (exact course cannot be given, but is unnecessary), steering toward the head of the bight. On either hand there are rocks covered at high water but the passage is safe if the rocks that show on each side be given an equal berth. Near the head of the bight will be seen an isolated square-shaped black rock. Leave this on the starboard hand and anchor beyond it with swinging room clear of it and the shore on the port hand in about 23 fathoms mud bottom. On account of the great depth there is scant swinging room. A stern line may be carried ashore if desired or to the rock. The The rock rises from deep water but at a low stage of the tide some heads show close to it. See sketch accompanying description of Black Cape A.

86. Ban Island is mountainous. Besides "Peak g" (see description) there are one or two summits to north-ward of this. The west-

ern end of the island appears to be clear of dangers, excepting close to shore where there is a growth of kelp.

87. Paramanoff Bay lying between the cape of that name and Ban Island affords anchorage ~~anchorage~~ exposed only to west, north-west and north. The bay has not been surveyed and full information cannot be furnished. The extent of the reef off entrance on south-west side, mentioned in descriptive report accompanying topographic sheet No. 2 is not known. 18 fathoms was the least water found on a line of soundings run 1 1/4 miles off this shore. There is great depth in the middle of the bay, but a ridge appears to extend across the entrance. On a line of soundings run outward from the anchorage the depth was found to change suddenly from 80 to 18 fathoms.

88. The anchorage used by the "Explorer" is on south side 3 miles eastward of the south-west entrance about 1/2 mile off a rocky shore in 22 fathoms soft bottom. There is a short sand beach just to eastward of the anchorage and a small rocky islet lies a short distance to westward close to shore. A conical peak near the shore bears S. 11° W. The anchorage is not very good in a north-east blow. It is recommended that the anchorage be approached by passing near west end of Ban Island. There is said to be good anchorage farther in, but no opportunity presented itself for making a reconnaissance of that part of the bay.

89. Cape Paramanof is described in report accompanying topographic sheet No. 2. Twenty five or thirty fathoms is found one mile from shore and the 100 fathom curve lies 2 1/2 miles off.

90. Alimvoak Bay is described in reports accompanying topographic sheet No. 1 and hydrographic sheet No. 2.

91. Steep Cape is described in report accompanying hydrograhic sheet of Alimvoak Bay (No. 2.)

92. Raspberry Strait was not examined.

93. The western part of Raspberry Island is high with steep slopes. Two noticeable valleys lead back from Shelikof Strait, the shore line receding a little at the valleys. The southern one of these appears to extend through to Onion Bay in Kupreanof Strait. At the north-west part of the island a steep slope faces both Raspberry and Shelikof Straits. A point on the shore line about 1 mile south-west of Raspberry Strait projects slightly (estimated at 1/2 mile) beyond a line drawn from Steep Cape to Raspberry Point. This fact is mentioned for the reason that the chart is not consistent therewith. In passing into Kupreanof Strait the point mentioned above is seen to close in range with the slope of Steep Cape and the slope of Cape Paramanof (not the shore line at Man$\Delta^{=}$) just before coming up to Raspberry Point.

94. The depth in Shelikof Strait northward of Kupreanof Strait is remarkably regular. The 100 fathom curve shows a narrow trough of varying width paralleling the eastern shore for the full length of the area investigated, its maximum depth being about 126 fathoms. The eastern side of this depression is steep, but the western side slopes gradually, and a depth much under 100 fathoms is not found until nearing the main shore. The most southern line shows more than 100 fathoms all the way across the strait, and the deepest cast (170 fathoms) was found on this line near the western side. There are several small patches having a depth over 100 fathoms and surrounded by less than that, but as the adjacent depths are not greatly less than 100 fathoms they are not deserving of particular mention.
A bank on which the regular lines show a depth of 56 fathoms surrounded by deeper water lies S. 50° E. 9 miles from Cape Douglas. The bank appears to be a ridge lying north and south. It would be well

to more completely develop this bank when detailed surveys of the adjacent coast are in progress.

95. Abreast of Ban Island inside of the 100 fathom curve some of the lines show irregular depths which should receive additional investigation when complete surveys of the locality are made. The least of these irregular soundings is 17 fathoms 3 miles N. 73° W. from Ban Af.

96. It is a fact worthy of mention that although Shelikof Strait is deep and the shores are in general bordered by mountains, great depth is not generally found near the land, and a vessel will find near the shore in almost any part of the strait a depth permitting anchorage. This statement does not however apply to the bays, in many of which the great depth restricts or prohibits anchorage.

97. Tides were observed for a short time in Alitvoak Bay. See tidal records and descriptive report accompanying hydrographic sheet of that bay. Automatic gauges were maintained by Assistant Hodgkins at Kodiak and Uyak. But few of the soundings on this sheet need be corrected for tide, but as the range is large it is recommended that soundings under 20 fathoms be roughly reduced to Lower low water.

98. Currents. No complete investigation of the currents of Shelikof Strait was made. Between June 12 and August 18th currents were observed at the ship's anchorages near the shore in various parts of the Strait. The extent of the observations varies from one or two determinations to series lasting several days, all of the current work being of secondary importance to other work in progress. The observations were in charge of Mr. Bernhardt, Mate.

99. The currents are principally tidal, but the relation of the current to the rise and fall of the tide is not in all cases clear. On the western side of the Strait a current of a half and three

quarters of a knot is recorded, setting along the shore in either direction. It is believed that along the western shore the southerly current predominates. Many of the sounding lines run across the Strait show a tendancy to set to the southward on that side.

100. Between Cape Douglas and Shaw Island the current is stronger, a two knot current being recorded, setting along the shore into and out of Kamishak Bay. The current seems to decrease in strength with increase of distance from shore. Apparently there is less current along the west coast of Afognak Island than on the opposite side of the Strait.

101. Strong tidal currents are encountered off the north-west side of Shuyak Island and heavy tide rips variable in position are frequently seen along the western side of Larsen Island and the offlying islets. The flood sets into Shelikof Strait and the ebb the opposite way. The direction of the set is dependent upon the adjacent land and a knowledge of its configuration will enable one to estimate closely the direction of the set. The greatest velocity recorded at a current station south-west side of Larsen Island is 1.3 knots dn the flood. This probably is not the maximum strength. On the day of the observations slack water occurred near the time of low water at Kodiak.

102. In reviewing the record of current observations it is noted that the position of many of the stations depends upon bearings taken on distant objects. Such positions are very weak and may be entirely inconsistent with adjacent features. I have revised the plotting of the stations, however, and they are all shown upon the sheet correct within the requirements of current observations, and even closely enough to represent the anchorage.

103. Weather. The observations of one party for a single season

cannot have a great deal of weight in deciding so uncertain a matter as the weather, but a report of such observations contributes to the general fund of information derived from all sources.

104. During the last summer gales were frequent and rain all but continuous. June was the best month and July perhaps the worst. North-east winds invariably bring rain and thick weather, and it is from this direction that most of the heavy weather comes. During the greater part of the season the wind when strong from this quarter rarely varied much in direction while its strength lasted and never backed. In the latter part of the season a north-east gale almost invariably backed through north-west to west or south-west, blowing with great force. South-east winds generally bring clouds but may be accompanied by either rain or fair weather. South- west and west winds are invariably accompanied by fine clear weather, but they often blow with great force. The south-west gale is perhaps the most to be dreaded in the Strait, as it raises a short heavy sea that is very trying on a small vessel. Southerly winds generally bring in haze, which sometimes is so thick as to resemble fog. North-west winds are perhaps the best for survey work as they bring fair weather and a clear atmosphere. Gales in this region last without intermission anywhere from a day to two or three days. Little fog was encountered during the season, but blinding snow storms were frequent early in the spring.

105. North-east winds are generally accompanied by a low barometer and south-west winds by a high barometer, but the rule is not invariable. The barometer is of little or no value in foretelling the weather, as it accompanies rather than precedes corresponding conditions. The slope of the barometer curve is apt to change suddenly, the weather changing with equal suddenness. The barograph

chart does not show any diurnal maximum or minimum. A sure sign of rainy weather and wind from north-east is the gathering of clouds on north-east side of the mountains.

106. The three magnetic elements were determined at stations Kiukpalik, South Douglas, Shuyak and Banner, the latter being in Alimvoak Bay. See magnetic records for results.

107. The region surveyed is not inhabited. The chart shows two or three Indian villages, but nothing was seen of them by this party. Natives were met with rarely. The region is visited by prospectors, but there are no mines in operation.

Respectfully submitted,

Walter A. Tinnell

Assistant, C. & G. Survey,
Chief of Party.

San Francisco, Cal.,
January 29, 1909.

HYDROGRAPHIC SIGNALS

Object and description	Lat.	D.M.	Long.	D.P.	Determined by
Peak a, Shuyak Id.	58 35	1260	152 23	770	Theodolite cuts
" d, N.W. corner Afognak Id.	58 25	700	152 43	630	" "
" c, N. end Afognak	58 23	620	152 39	550	" "
" e, E. of Black Cape	58 22	760	152 45	910	" "
" g, Ban Id.	58 18	1710	152 54	270	" "
" h, Cape Paramanof	58 16	1280	153 00	570	" "
" A, N.of Cape Douglas	58 57	850	153 25	810	" "
Trance, sharp peak S.of Alimvoak Bay	58 12	1000	153 10	170	(and hyd'c) Theodolite "
Pin ,Pinnacle rock on point	58 55	430	153 19	660	" "
Peak B, near North Douglas	58 54	1540	153 20	940	" "
" D,	58 51	850	153 32	410	" "
Large rock on shore line "Boulder"	58 46	1330	153 23	40	Sextant "
Peak F,	58 45	1430	153 31	380	Theodolite "
Sea Otter Reef,	58 45	1030	153 16	690	" "
Higher of two rocks "Two"	58 44	760	153 21	405	" "
Lean	58 37	1610	153 35	750	" "
Peak P	58 28	710	154 18	330	" "
" O	58 23	410	154 01	510	" "
Shakun rock	58 32	1374	153 41	652	Computation
Glass, on Islet N. Alimvoak Bay	58 15	970	153 06	450	Plane table and theodolite cuts
See below - next sheet - for ⊙s R. & Q. See Alimvoak Bay sheet - hyd. sheet - for ⊙ ENT.					
Mountain Peaks					
H"4 peakedmt."					
H, "Four peaked mt." no. pk.	58 46	100	153 40	800	Theodolite cuts
" so. p	58 45	1410	153 40	640	" "
E	58 45	970	153 30	240	" "
G	58 44	1470	153 31	320	" "

✓ W.B.

2980

MOUNTAIN PEAKS (con.)

Peak	Lat.	D.M.	Long.	D.P.	Determined by
I	58 42	1030	153 35	630	Theodolite cuts
J	58 40	1360	153 35	490	" "
K	58 40	1830	153 41	800	" "
M	58 38	1150	153 52	30	" "
N	58 31	1290	154 03	290	" "
S	58 14	340	154 12	680	" "
T	58 13	120	154 14	50	" "
⊙ Q - Mountain Pt.	58 25	1290	154 23	570	" "
⊙ R - " "	58 17	580	154 10	740	" "
See Alimvoak Bay Sheet for ⊙ Ent.					

W 1330

Hyd Sheet No 2980 Apr. 30, 1909.

Outside of the fifty fathom curve the ground is fairly well covered with the exception of a large area north of Larsen Bd and the area between Kuekpalik Id and Cape Kukshak. There is a bank located E 7° S, 7½ miles from Sea Otter Id and two 61 fath. spots near Shakun Rk which should be developed. also two spots off Sea Otter Isle —

The soundings records are clear and well kept.

H L Simons

Ver: [illegible]
6-28-09

DEPARTMENT OF COMMERCE AND LABOR

Coast and Geodetic Survey

O. H. Tittmann, Supt.

Hydrographic Sheet No._____

(Field No. 1)

2980

Shelikof Strait, Alaska.

Steamer "Explorer"

Assistant Walter C. Dibrell, Chief of Party.

Begun: August 12th.

Completed Oct. 9th

1908.

Scale 1-200,000

Hydrography in charge of Walter C. Dibrell, Ass't.

Protection by W. B. Dunning, Aid.

Positions plotted by H. L. Simmons

Sounding " " H. L. Simmons

Topography plotted by W. B. Dunning, Aid.

Soundings in fathoms

Verified H. L. Williams 6-28-09

Observers

Walter C. Dibrell, Assistant.

F. H. Hardy, "

L.M.Hopkins, Chief Engineer.

R. H. Hawkes, Surgeon.

Henry Bernhardt, Mate.

S. W. Tay, Aid.

W. B. Dunning, "

2980

Recorders

Harold Olsen, Chf. Wr.

H. L. Hansen, Wr. 2cl.

Leadsmen

Emil Moen, Q. M. 1 cl.

Enoch Hansen, " 2 cl.

Ernst Schulz, " 2 cl.

O. T. Bolgen, " 2 cl.

William Duker, " 2 cl.

Tidal observations at Uyak, Kodiak Id., Alaska and Alimvoak Bay, Afognak Island, Alaska.

Tide Observers-Alimvoak Bay.

Oscar Carlson, Seaman.

F. W. Malchau, "

11/25/+08.

STATISTICS

2980

Date	Vol.	Let.	Miles (Naut.)	Sdgs.	Angles	Boat
Aug. 12	1	A	16.0	25	44	"Explorer".
" 13	1	B	52.0	66	50	"
" 14	1	C	45.0	62	93	"
" 21	1	D	25.0	46	78	"
" 28	1	E	7.25	23	46	"
" 31	1	F	14.0	29	58	"
Sept. 1	1	G	45.0	100	171	"
" 2	1&2	H	30.0	67	134	"
" 4	2	J	35.0	47	94	"
" 5	2	K	43.0	93	148	"
" 7	2	L	41.0	61	110	"
" 8	2	M	47.0	102	136	"
" 9	2	N	40.0	62	120	"
" 18	3	O	3.5	8	16	"
" 24	3	P	39.0	46	92	"
" 29	3	S	2.0	6	12	"
Oct. 1	3	T	5.8	24	44	"
" 2	3	U	35.0	66	132	"
" 3	3	V	32.0	59	116	"
" 6	3	W	13.0	29	48	"
" 7	3	X	21.0	17	32	"
" 9	3	Y	49.0	64	122	"
Totals	3	22	640.55	1102	1896	"

Applied to Charts No.

8555.

8534 (1935), 1:80,000, by James W. McGuire

NAUTICAL CHARTS BRANCH

SURVEY NO. H-2980

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
4 Oct 48	8533	Nichols	~~Before~~ After Verification and Review
18 Apr 79	16648	D.A. Clement	Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.